

USGS Decadal Trends Mapper:

Evaluating and communicating decadal-scale changes in the nation's groundwater quality

National Water Quality Monitoring Council

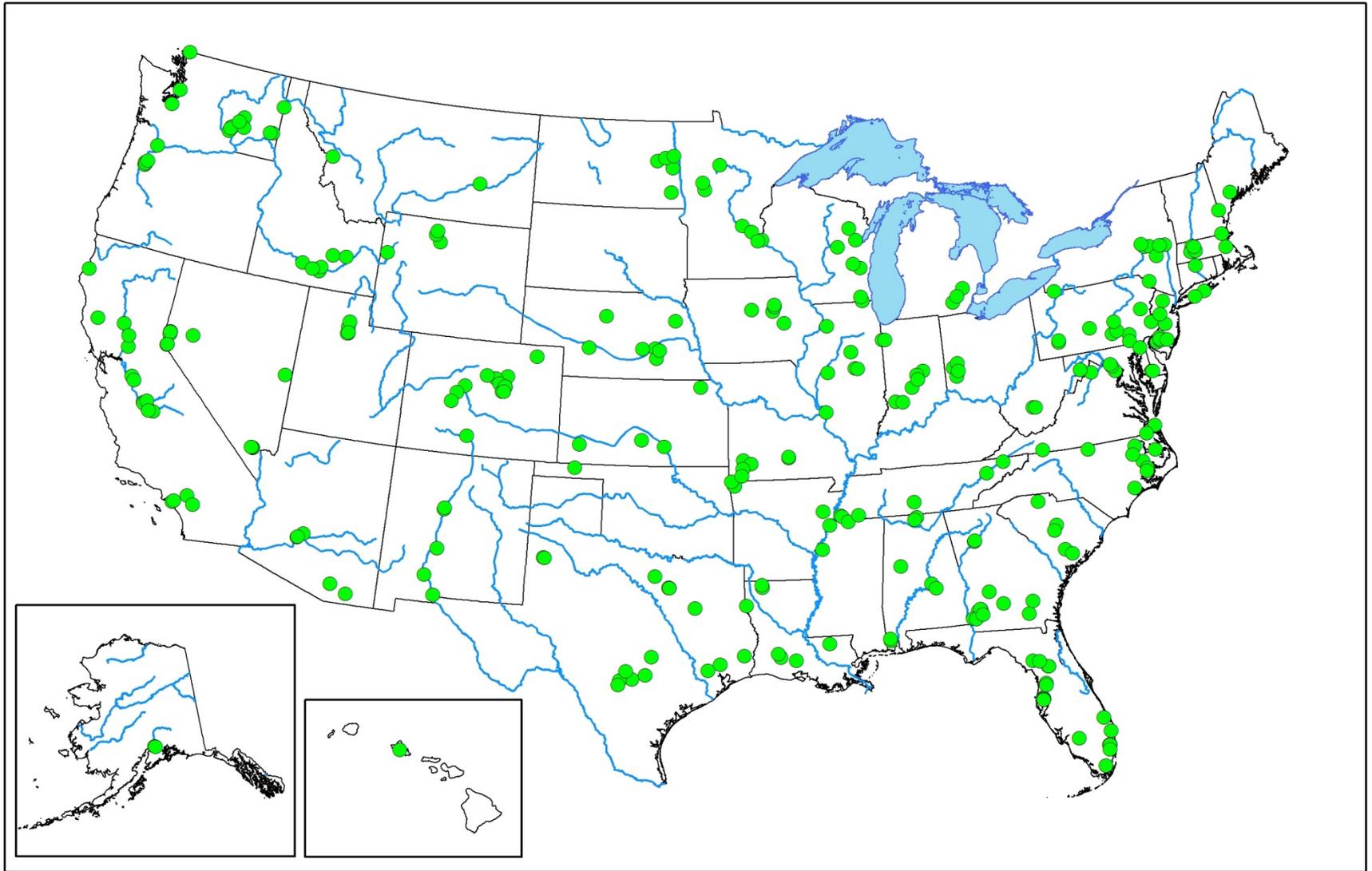
Web Meeting, October 17th 2016

Bruce Lindsey, U.S. Geological Survey

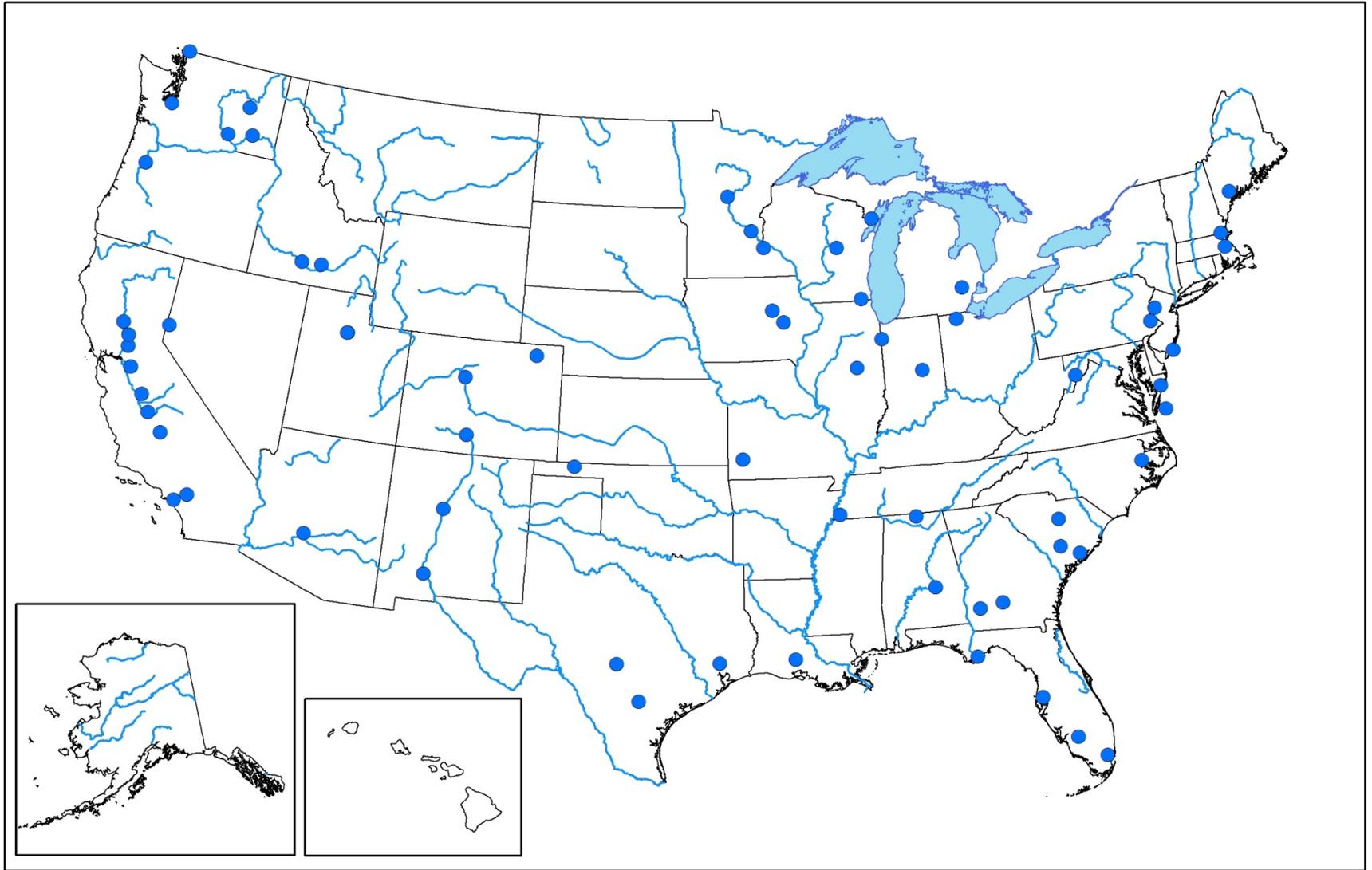
National Water-Quality Assessment (NAWQA) Project Groundwater Sampling

- 1988-92 Pilot studies
- 1993-2001 Cycle 1
- 2002-2012 Cycle 2
- 2013-2022 Cycle 3

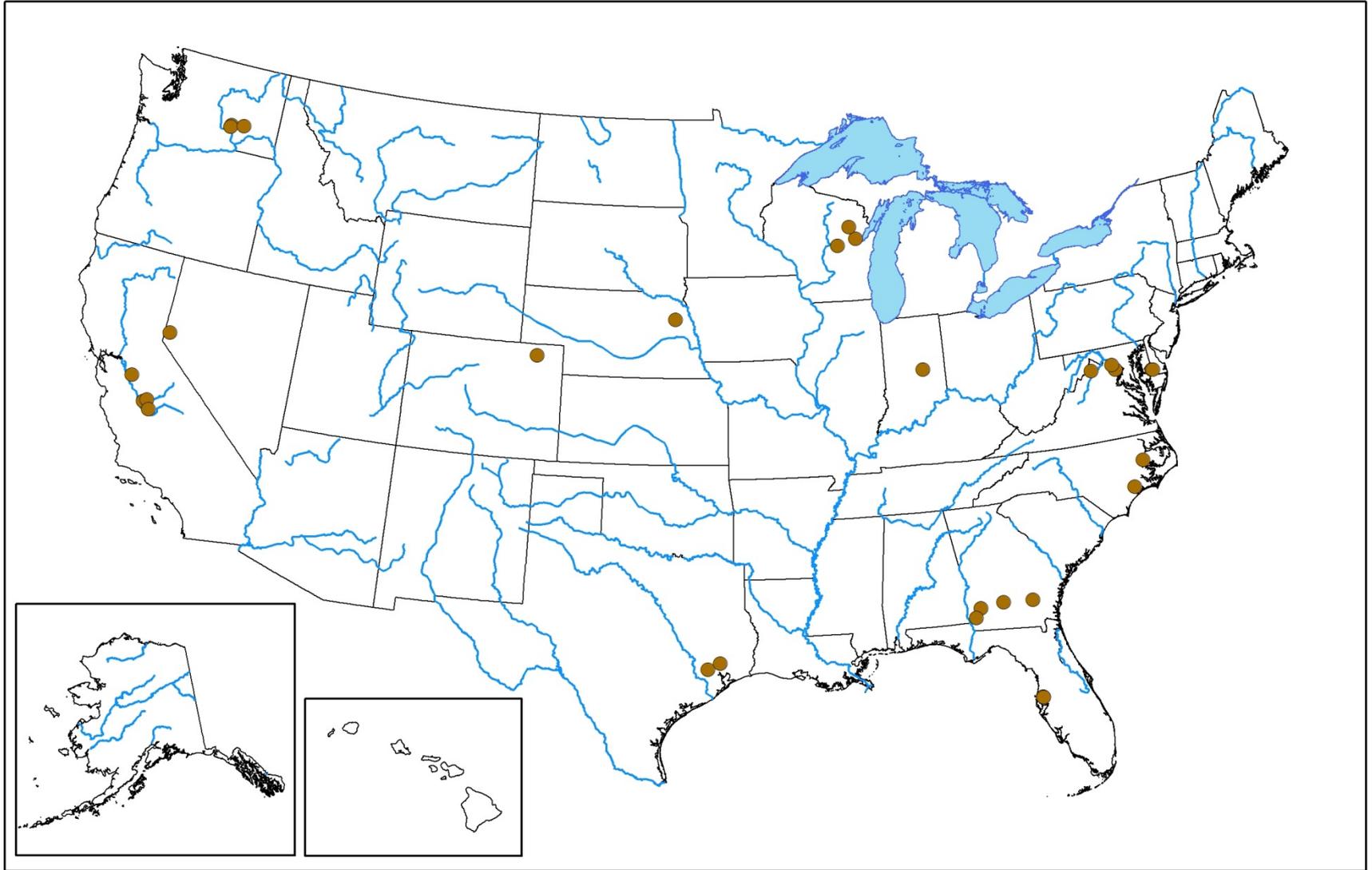
289 Networks Sampled at least once



67 Networks resampled 2002-2012



26 Networks resampled since 2012

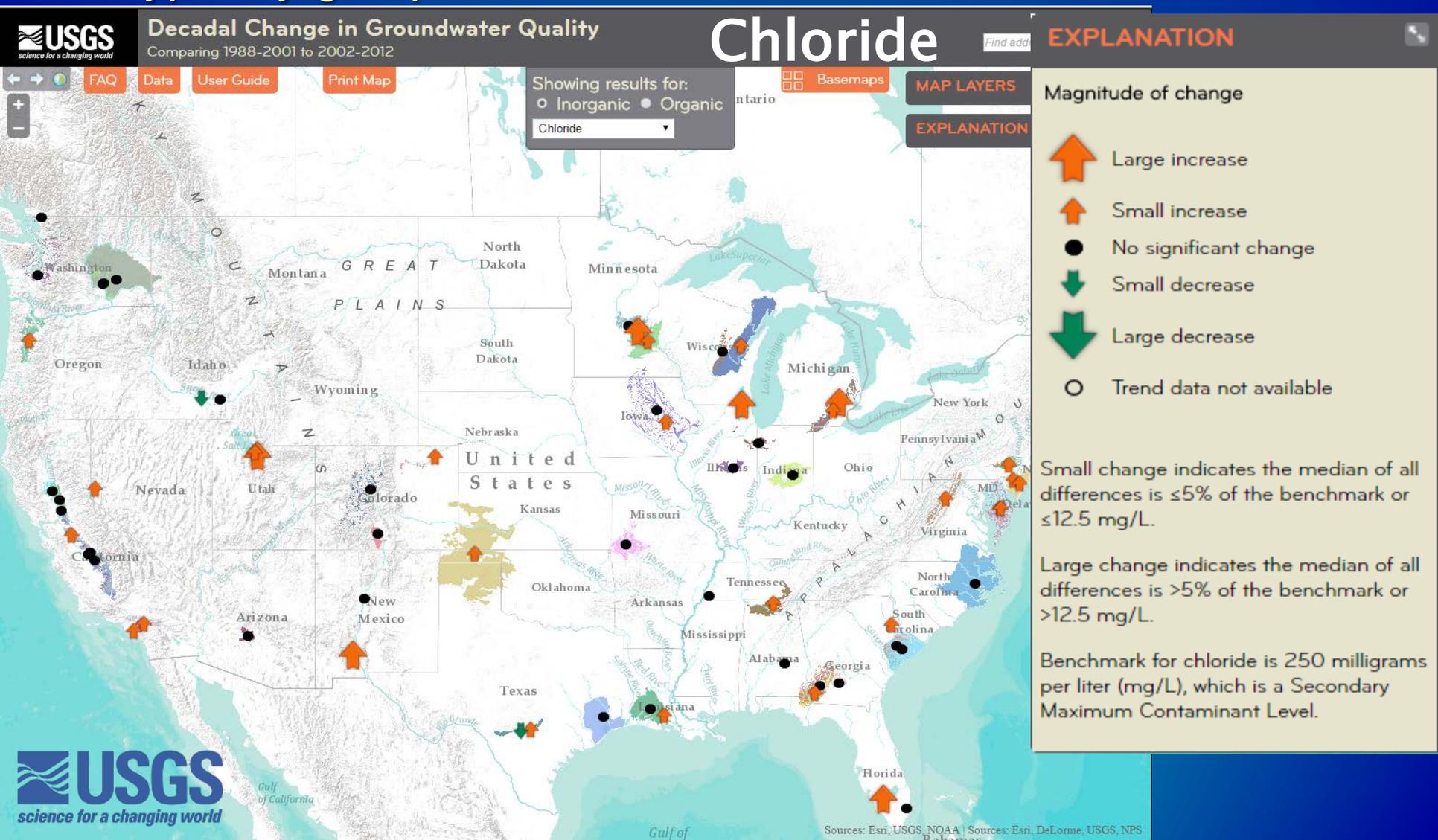


Which contaminants are changing?

- An interactive web-based map provides information on decadal-scale changes in groundwater quality.
- Contaminants are mapped:
 - If they are present at high concentrations
 - Frequently detected organic compounds

- Results of statistical analysis are displayed on an interactive map.
- 13 inorganic constituents such as nitrate and chloride
- 11 organic constituents such as atrazine and chloroform

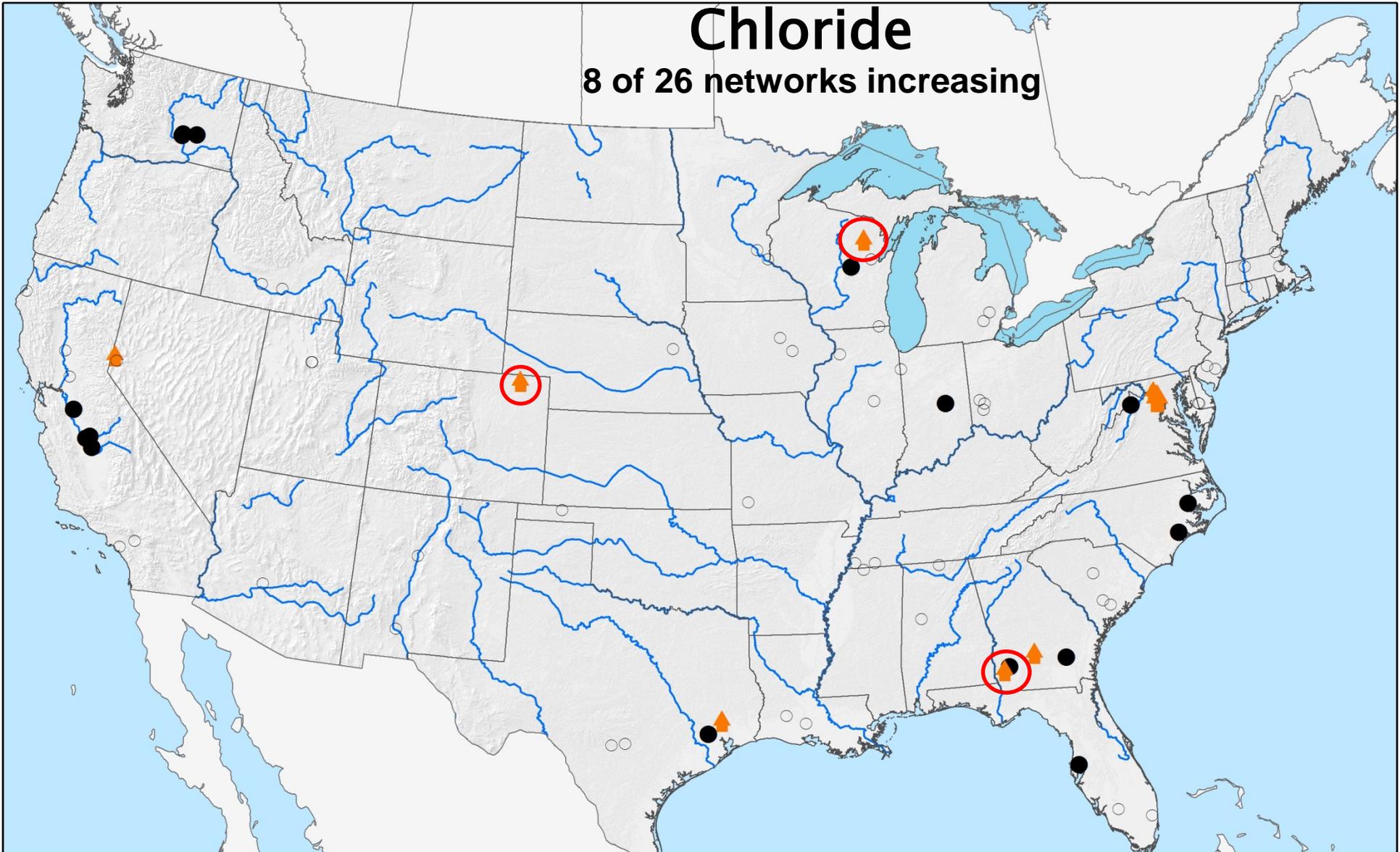
The map shows the location of 67 networks, which are typically groups of 20-30 wells.



2012 to 2015: Are concentrations still increasing?

Chloride

8 of 26 networks increasing



Decadal Change in Groundwater Quality

Comparing 1988-2001 to 2002-2012

Nitrate

Find address or place

FAQ Data User Guide Print Map

Showing results for:
○ Inorganic ● Organic
Nitrate

Basemaps

MAP LAYERS

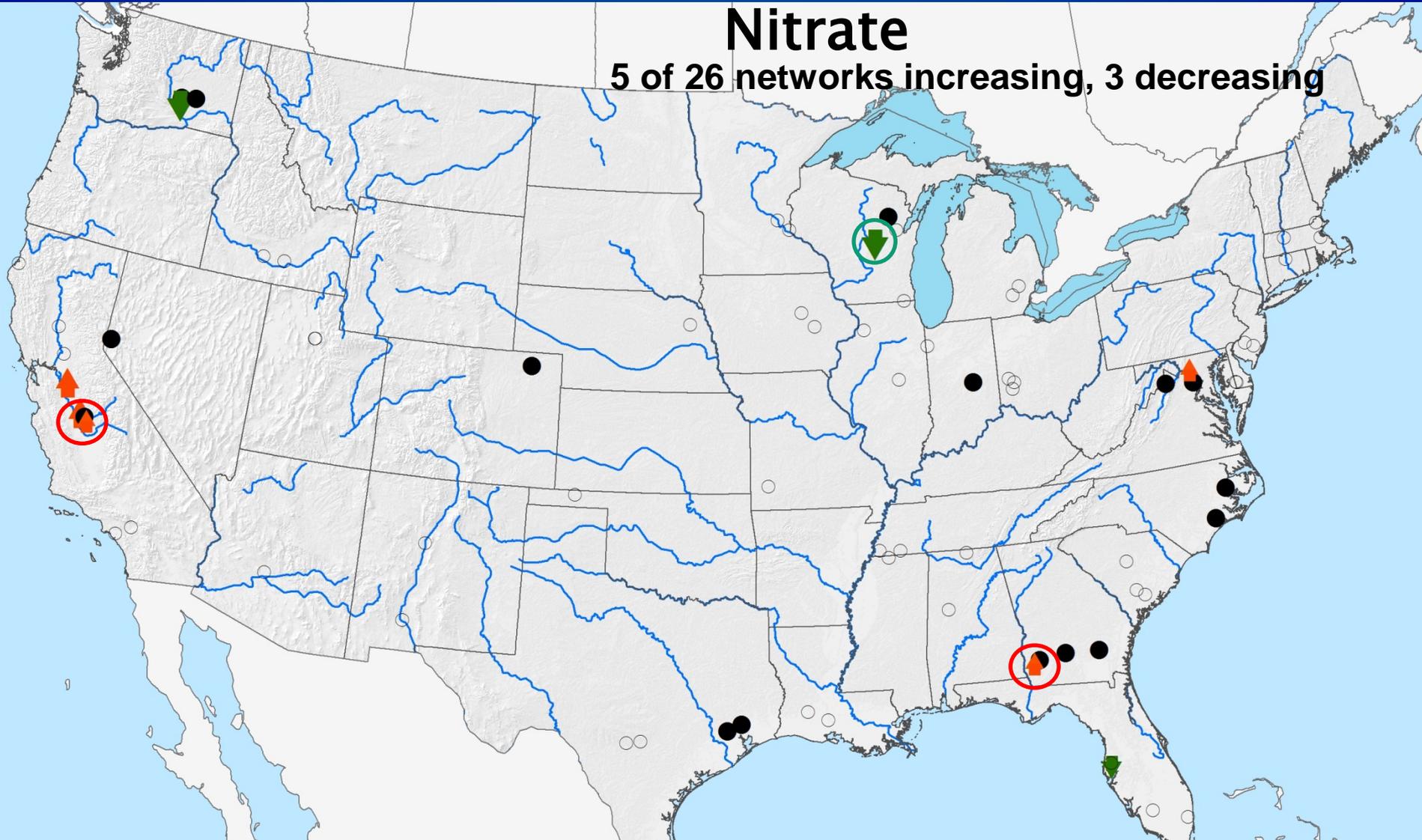
EXPLANATION



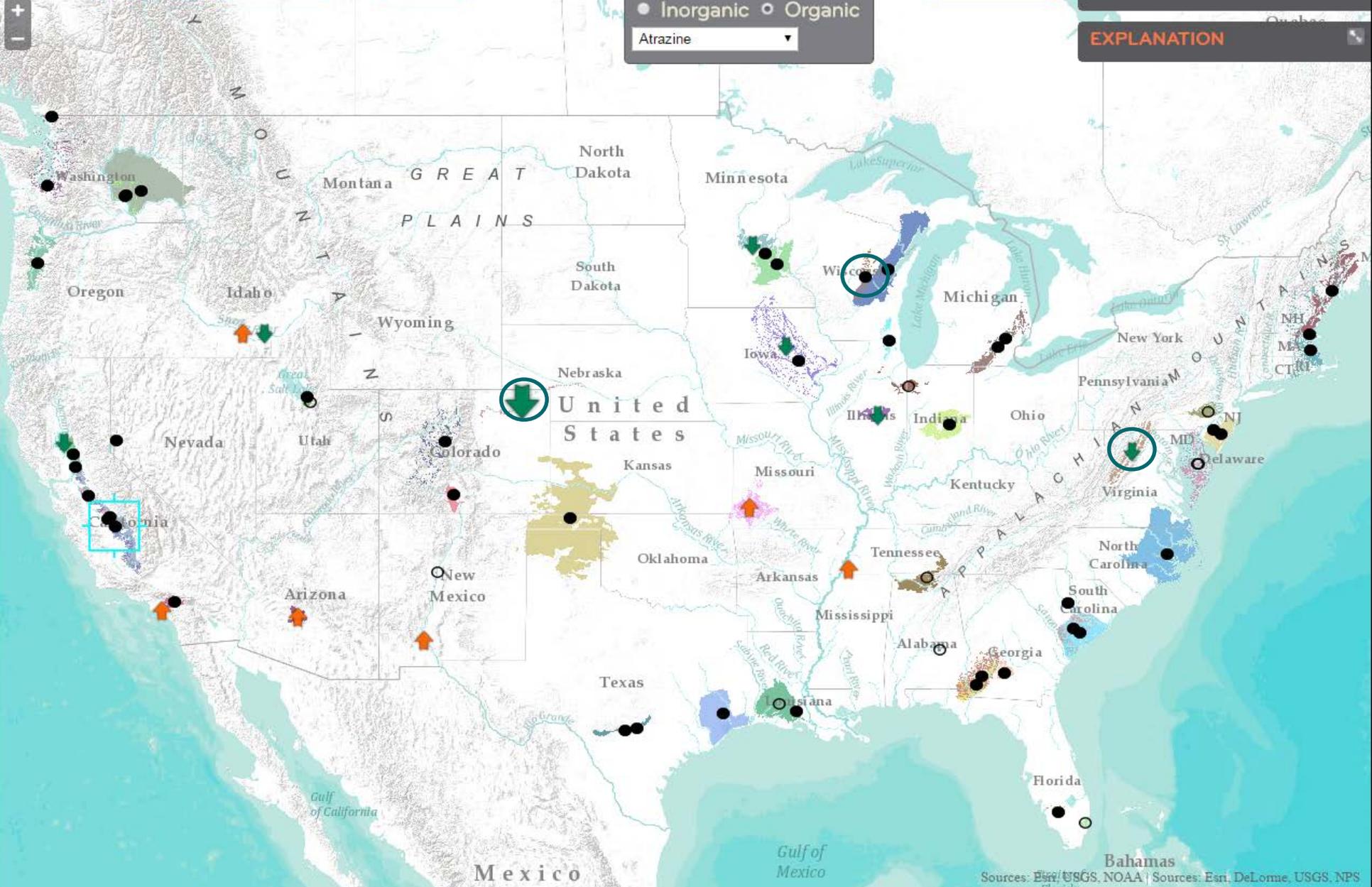
2012 to 2015: Are concentrations still increasing?

Nitrate

5 of 26 networks increasing, 3 decreasing



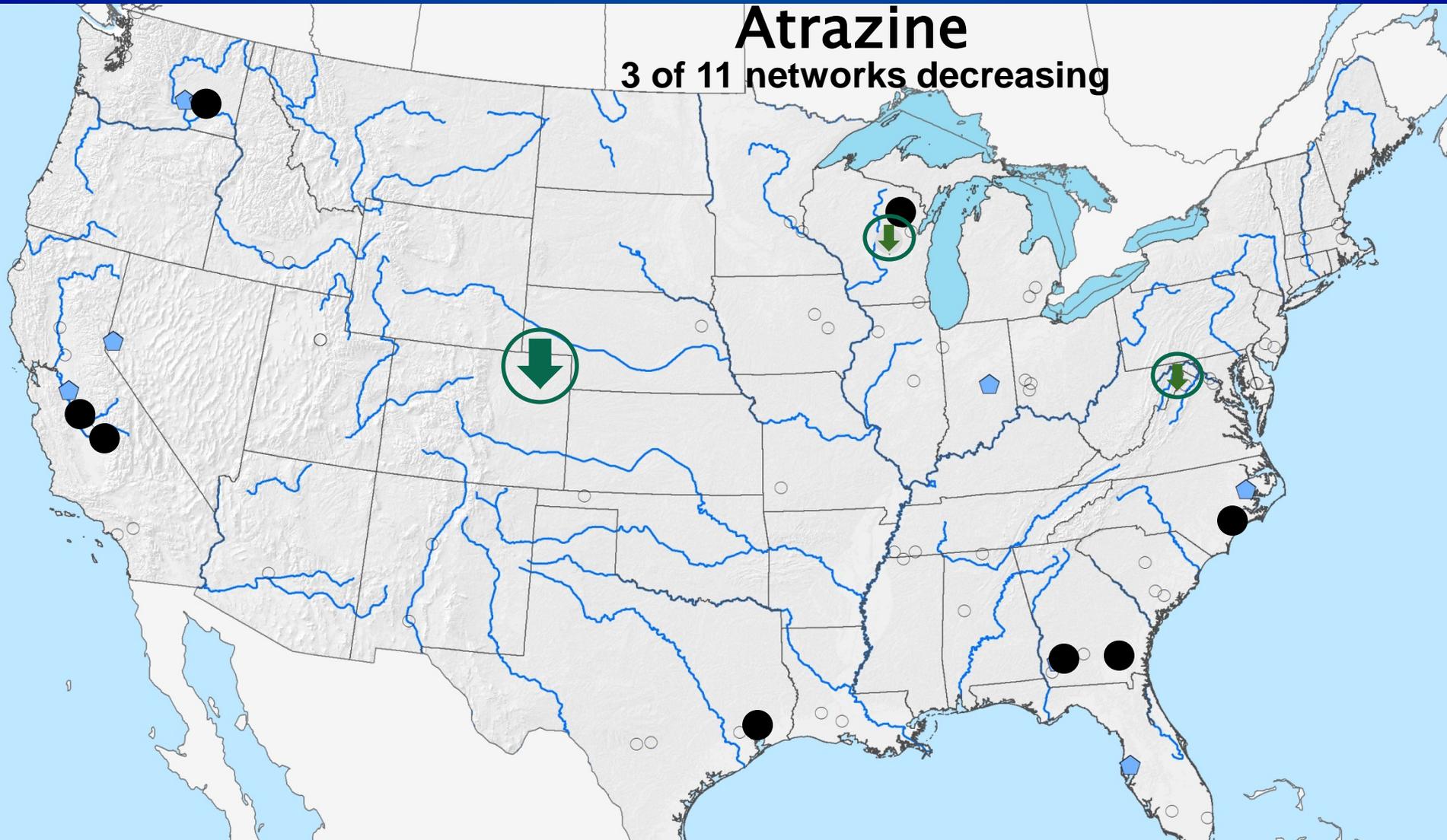
Showing results for:
● Inorganic ○ Organic
Atrazine



2012 to 2015: Are concentrations still decreasing?

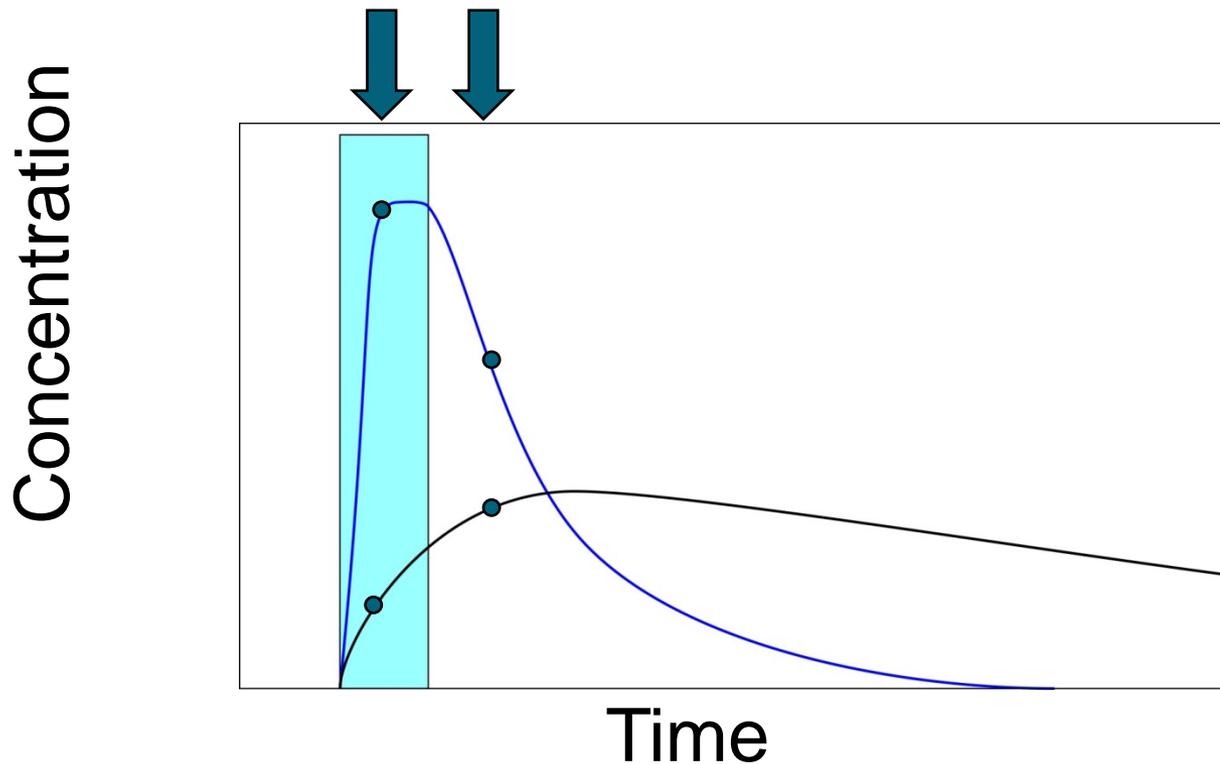
Atrazine

3 of 11 networks decreasing

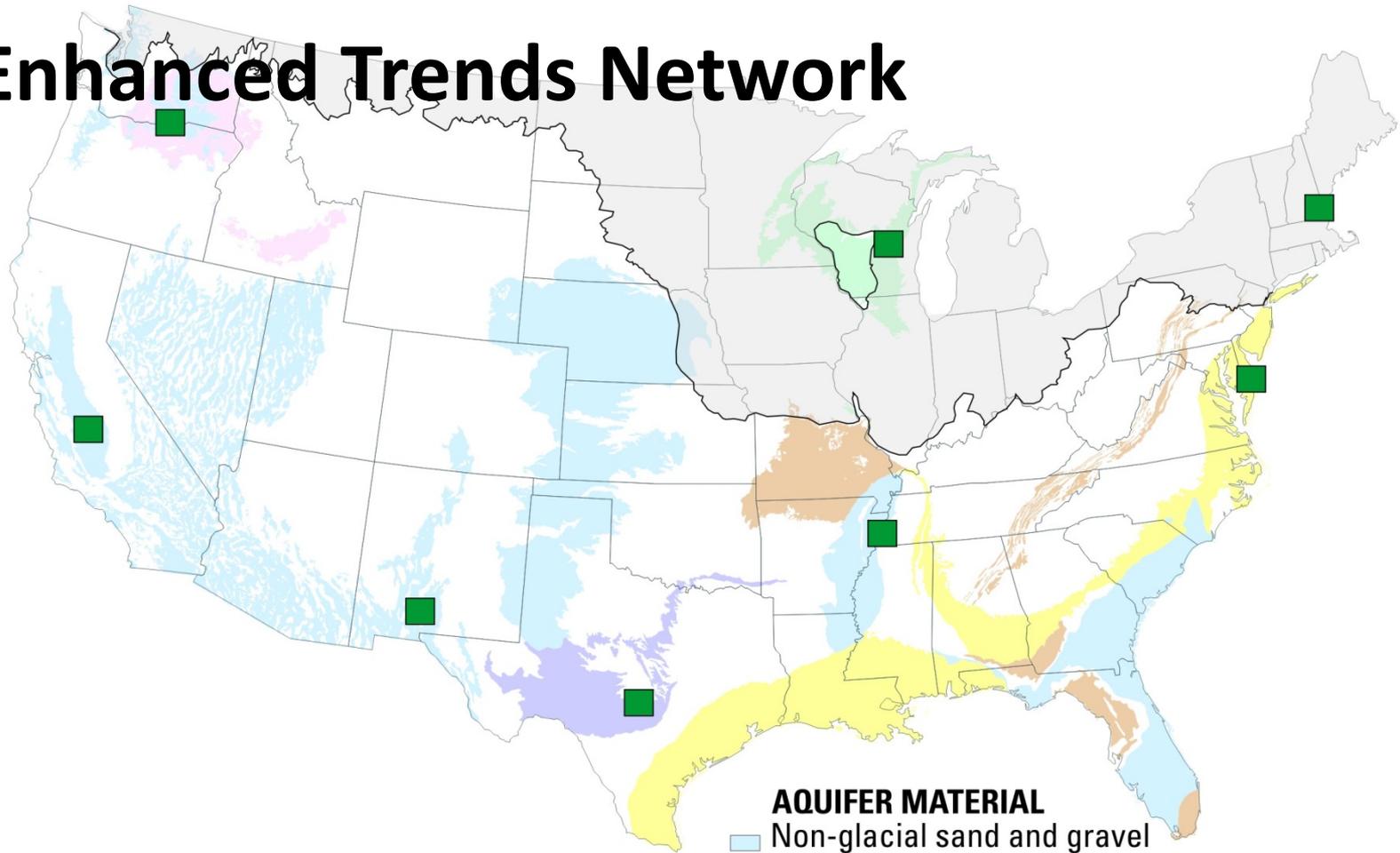


Where do the decadal samples fall?

Response to hypothetical 25-year contaminant release



Enhanced Trends Network



■ Enhanced Trends Network Location

AQUIFER MATERIAL

- Non-glacial sand and gravel
- Glacial sand and gravel
- Coastal plain semi-consolidated sand
- Sandstone
- Sandstone and carbonate-rock
- Carbonate-rock
- Basaltic-rock

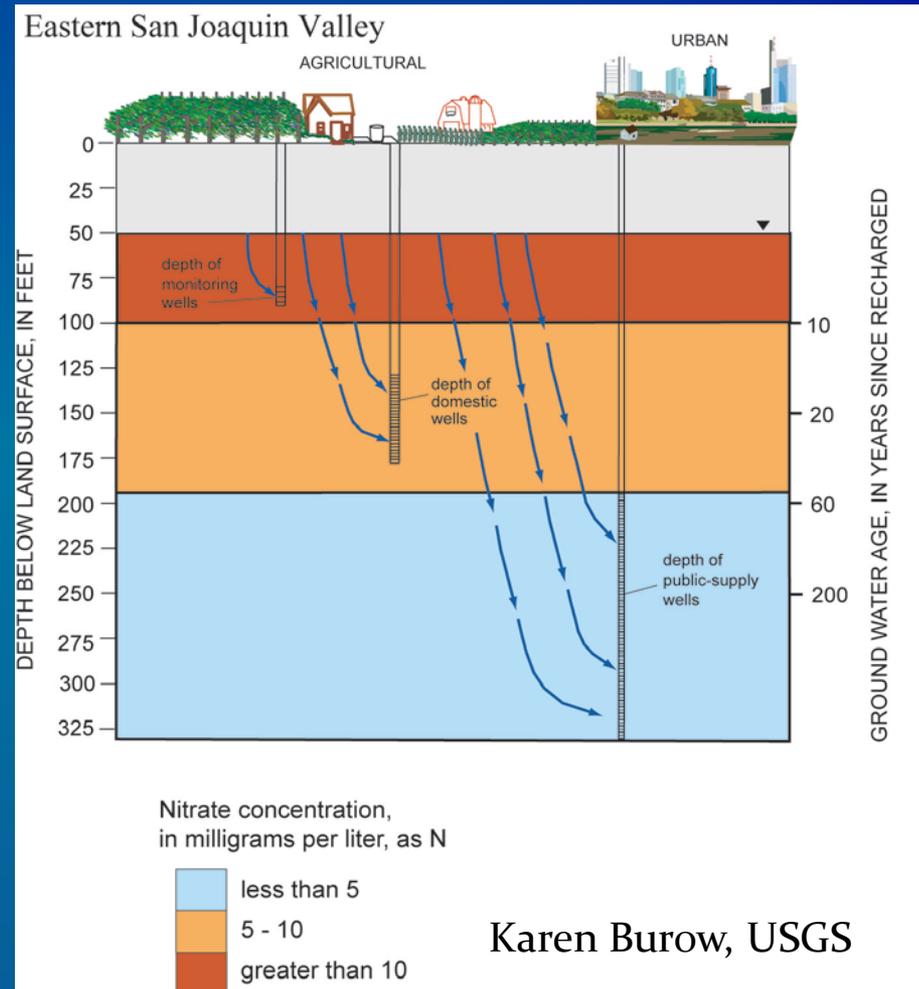
Short-term and seasonal variability

- Enhanced trends network
 - Daily measurement of specific conductance, dissolved oxygen, pH, water level, and in some cases, nitrate.
 - Understanding how short-term variability affects decadal analysis
 - Determine drivers of change

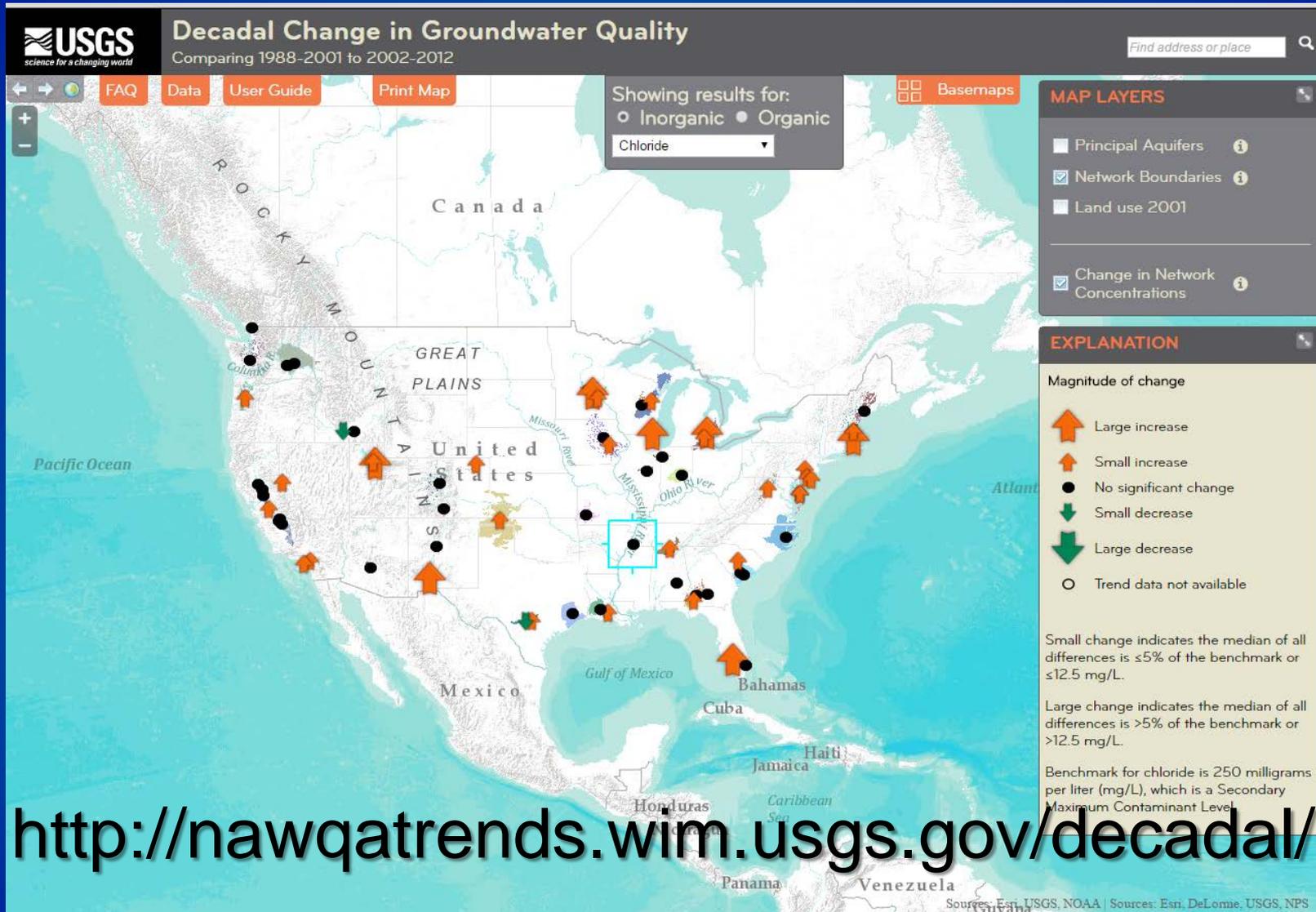


Effects of groundwater age

- Vertical flow path studies
- Sampling at various levels to establish age-contaminant relations



Questions?



<http://nawqatrends.wim.usgs.gov/decadal/>